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EXAMINER	
ZERVIGON, RUDY	

ART UNIT	PAPER NUMBER
1792	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/925,579	NAKANO ET AL.	
	Examiner	**Art Unit**	
	Rudy Zervigon	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 January 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-8,64,65,67,68,71-78,81,83-87 and 90* is/are pending in the application.

4a) Of the above claim(s) *2-8,64,65,67,68,71-74 and 90* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *74-78,81,83-87 and 90* is/are rejected.

7)☒ Claim(s) *81* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 90 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventors, at the time the application was filed, had possession of the claimed invention. Claim 90 requires in part "…thickness of the insulation material between the plasma excitation electrode and the chamber wall is sufficient to provide a vertical spacing … *the thickness being such that three times the first series resonant frequency f0 is larger than a power frequency fe supplied from the radio frequency generator*". The specification, as filed, provides no teaching of the relationship between the three variables: insulator thickness, fo, and fe. How does one of ordinary skill in the art arrive at the desired condition while varying the thickness of the claimed insulator?

Specification

3. The amendment filed January 4, 2010 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: See 112 rejection above.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Objections

4. Claim 81 objected to because of the following informalities: The status identifier recites that the claim is amended, yet not changes are shown. Appropriate correction is required.

Claim Rejections - 35 USC §103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 74-79, 81, 85-89 are rejected under 35 U.S.C. 103(a) as obvious over Murata et al (USPat. 5,423,915) and Patrick (USPat. 5,474,648) in view of Stramke (USPat. 4,645,981). Murata teaches a plasma processing apparatus (Figure 1; column 5; line 44 - column 6; line 11) comprising: a plasma processing chamber (1; Figure 1; column 5; line 44 - column 6; line 11) having a plasma excitation electrode (2; Figure 1; column 5; line 44 - column 6; line 11) for exciting a plasma; a radio frequency generator (4; Figure 1; column 5; line 44 - column 6; line 11) for supplying a radio frequency voltage to the electrode (2; Figure 1; column 5; line 44 - column 6; line 11); a radio frequency feeder (105; Figure 1; column 5; line 44 - column 6; line 11) connected to the electrode (2; Figure 1; column 5; line 44 - column 6; line 11); a matching circuit (104; Figure 1; column 5; line 44 - column 6; line 11) having an input terminal (104/4 interface; Figure 1; column 5; line 44 - column 6; line 11) and an output (106, 109; Figure 1; column 5; line 44 - column 6; line 11) end, wherein the input terminal (104/4 interface; Figure 1; column 5; line 44 - column 6; line 11) is connected to the radio frequency generator (4; Figure 1; column 5; line 44 - column 6; line 11) – claim 74.

Applicant's claim 74 limitations of

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a set of electrical radio frequency factors of the plasma processing chamber configured such that three times a first series resonant frequency f0 of the plasma processing chamber, is larger than a power frequency fe of the radio frequency voltage, wherein the first series resonant frequency f0 corresponds to a minimum impedance of the plasma processing chamber.

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And all of claims 88 and 89 appear to be a claim recitation of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey,152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

Murata further teaches that at least one of the shape of a feed plate (105; Figure 1; column 5; line 44 - column 6; line 11), the overlap area (column 8; lines 45-59) of the plasma excitation electrode and a chamber wall, insulation material between the plasma excitation electrode and the chamber wall, or the capacitance (column 8; lines 45-59) between a susceptor electrode and the chamber wall are considered result-effective variables for film thickness distribution and film forming speed as taught by Murata (column 8; lines 45-59).

Applicant's following claim limitations, not taught by Murata, but are also are believed to be intended use requirements of the pending apparatus claims:

i. The plasma processing apparatus (Figure 1; column 5; line 44 - column 6; line 11) according to claim 74, wherein a frequency of 1.3 times the first series resonant frequency f0 is larger than a power frequency fe, as claimed by claim 75

ii. The plasma processing apparatus (Figure 1; column 5; line 44 - column 6; line 11) according to claim 75, wherein the first series resonant frequency f0 is larger than three times the power frequency fe, as claimed by claim 76

iii. The plasma processing apparatus (Figure 1; column 5; line 44 - column 6; line 11) according to claim 76, wherein a series resonant frequency f0' which is defined by a capacitance between the plasma excitation electrode (2; Figure 1; column 5; line 44 - column 6; line 11) and a counter electrode (2; Figure 1; column 5; line 44 - column 6; line 11) for generating the plasma in cooperation with the plasma excitation electrode (2; Figure 1; column 5; line 44 - column 6; line 11), is larger than three times the power frequency fe, as claimed by claim 77

iv. The plasma processing apparatus (Figure 1; column 5; line 44 - column 6; line 11) according to claim 77, wherein the plasma excitation electrode (2; Figure 1; column 5; line 44 - column 6; line 11) and the counter electrode (2; Figure 1; column 5; line 44 - column 6; line 11) are of a parallel plate type, and the series resonant frequency f0' and the power frequency fe satisfy the relationship:

$f_0^{'} > \sqrt{\frac{d}{\delta}} f_e$ wherein d represents a distance between the plasma excitation electrode (2; Figure 1; column 5; line 44 - column 6; line 11) and the counter electrode (3; Figure 1; column 5; line 44 - column 6; line 11), and δ represents a sum of a distance between the plasma excitation electrode

(2; Figure 1; column 5; line 44 - column 6; line 11) and a generated plasma and a distance between the counter electrode (3; Figure 1; column 5; line 44 - column 6; line 11) and a generated plasma, as claimed by claim 78.

Murata further teaches a plasma processing apparatus (Figure 1; column 5; line 44 - column 6; line 11) comprising: a plasma processing chamber (1; Figure 1; column 5; line 44 - column 6; line 11) having a plasma excitation electrode (2; Figure 1; column 5; line 44 - column 6; line 11) for exciting a plasma and a first series resonant frequency f0; a radio frequency generator (4; Figure 1; column 5; line 44 - column 6; line 11) for supplying a radio frequency voltage to the electrode (2; Figure 1; column 5; line 44 - column 6; line 11); a radio frequency feeder (105; Figure 1; column 5; line 44 - column 6; line 11) connected to the electrode (2; Figure 1; column 5; line 44 - column 6; line 11); and a matching circuit (104; Figure 1; column 5; line 44 - column 6; line 11) having an input terminal (104/4 interface; Figure 1; column 5; line 44 - column 6; line 11) and an output (106, 109; Figure 1; column 5; line 44 - column 6; line 11) end, wherein the input terminal (104/4 interface; Figure 1; column 5; line 44 - column 6; line 11) is connected to the radio frequency generator (4; Figure 1; column 5; line 44 - column 6; line 11) and the output (106, 109; Figure 1; column 5; line 44 - column 6; line 11) end is connected to an end of the radio frequency feeder (105; Figure 1; column 5; line 44 - column 6; line 11) so as to achieve impedance matching between the plasma processing chamber (1; Figure 1; column 5; line 44 - column 6; line 11) and the radio frequency generator (4; Figure 1; column 5; line 44 - column 6; line 11) – claim 85

Murata further does not teach:

v. a measuring terminal for measuring a resonant frequency of the plasma processing chamber (1; Figure 1; column 5; line 44 - column 6; line 11) in the vicinity of an end of the radio frequency feeder (105; Figure 1; column 5; line 44 - column 6; line 11); a switch positioned between the radio frequency feeder (105; Figure 1; column 5; line 44 - column 6; line 11) and the measuring terminal, the switch having a first configuration comprising a connection between the end of the radio frequency feeder (105; Figure 1; column 5; line 44 - column 6; line 11) and the output (106, 109; Figure 1; column 5; line 44 - column 6; line 11) end of the matching circuit (104; Figure 1; column 5; line 44 - column 6; line 11), the end of the radio frequency feeder (105; Figure 1; column 5; line 44 - column 6; line 11) being separated from the measuring terminal, and a second configuration comprising a connection between the end of the radio frequency feeder (105; Figure 1; column 5; line 44 - column 6; line 11) and the measuring terminal, the end of the radio frequency feeder (105; Figure 1; column 5; line 44 - column 6; line 11) being separated from the matching circuit (104; Figure 1; column 5; line 44 - column 6; line 11), wherein the first configuration corresponds to a plasma excitation mode of the chamber (1; Figure 1; column 5; line 44 - column 6; line 11) and the second configuration corresponds to a measuring mode of the chamber (1; Figure 1; column 5; line 44 - column 6; line 11) - claim 74, 85.

vi. The plasma processing apparatus (Figure 1; column 5; line 44 - column 6; line 11) according to claim 74, further comprising a resonant frequency measuring unit which is detachably connected to the measuring terminal, as claimed by claim 81

vii. wherein at least one of the *shape* of the radio frequency feeder (105; Figure 1; column 5; line 44 - column 6; line 11), an overlapping area of the plasma excitation electrode (2; Figure 1; column 5; line 44 - column 6; line 11) and a chamber wall, a thickness of insulation material between the plasma excitation electrode (2; Figure 1; column 5; line 44 - column 6; line 11) and the chamber wall, **and** a capacitance between a susceptor electrode (2; Figure 1; column 5; line 44 - column 6; line 11) and the chamber wall is adjusted such that three times the first series resonant frequency fo is larger than a power frequency fe supplied from the radio frequency generator (4; Figure 1; column 5; line 44 - column 6; line 11) – claim 85

viii. The plasma processing apparatus (Figure 1; column 5; line 44 - column 6; line 11) according to claim 85, wherein at least one of the *shape* of the radio frequency feeder plate (105; Figure 1; column 5; line 44 - column 6; line 11), the overlapping area of the plasma excitation electrode (2; Figure 1; column 5; line 44 - column 6; line 11) and the chamber wall, the thickness of the insulation material between the plasma excitation electrode (2; Figure 1; column 5; line 44 - column 6; line 11) and the chamber wall, and the capacitance between the susceptor electrode (2; Figure 1; column 5; line 44 - column 6; line 11) and the chamber wall is adjusted such that 1.3 times the first series resonant frequency f0 is larger than the power frequency fe, as claimed by claim 86.

ix. The plasma processing apparatus (Figure 1; column 5; line 44 - column 6; line 11) according to claim 86, wherein at least one of the *shape* of the radio frequency feeder plate (105; Figure 1; column 5; line 44 - column 6; line 11), the overlapping area of the plasma excitation electrode (2; Figure 1; column 5; line 44 - column 6; line 11) and a

chamber wall, the thickness of the insulation material between the plasma excitation electrode (2; Figure 1; column 5; line 44 - column 6; line 11) and the chamber wall, and the capacitance between a susceptor electrode (2; Figure 1; column 5; line 44 - column 6; line 11) and the chamber wall is adjusted such that the first series resonant frequency fo is larger than the power frequency fe, as claimed by claim 87

Patrick teaches a plasma reactor (104, Figure 2a; column 6; line 54 – column 7; line 25) including a variable RF parameter sensor/"measuring terminal" (202; Figure 2a) which measures power, voltage, current, phase angle, harmonic content (abstract), and impedance parameters at the plasma chamber electrode (112; Figure 2a, claim 5).

<u>Patrick also shows that the end of Patrick's radio frequency feeder (wire between 112 and 202, end at 112; Figure 2a) is separated from the measuring terminal (202; Figure 2a), and that the end of Patrick's radio frequency feeder (wire between 112 and 202, end at 112; Figure 2a) is separated from Patrick's matching circuit (120; Figure 2a).</u>

That Patrick et al measures a frequency, resonant or otherwise, at the plasma chamber electrode is inherent because the applied frequency is that of the dynamic voltage and current that are measured and dynamically controlled (claim 6). The Examiner believes Patrick's apparatus is inherent in setting a frequency f_0 corresponding desired, or optimized values, including "corresponding" a minimum impedance (as measured by Patrick) of the plasma processing chamber. That Patrick can measure the minimum impedance with the plasma chamber disconnected from the plasma apparatus during a non-discharge period, is a claim requirement of intended use. See above.

Patrick further teaches that his plasma processing apparatus (Figure 2a; column 6; line 54 – column 7; line 25) produces frequencies which is defined by a capacitance between the plasma excitation electrode (112; Figure 2a) and a counter electrode (114; Figure 2a) for generating the plasma in cooperation with the plasma excitation electrode (112; Figure 2a). Further when the structure recited in the references is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent. Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established. In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA1977) – MPEP 2114.

Applicant's claim 74 limitations of "the first configuration corresponding to a plasma excitation mode of the chamber and the second configuration corresponding to a measuring mode of the chamber" are claim requirements of intended use in the pending apparatus claims. Further, it has been held that claim language that simply specifies an intended use or field of use for the invention generally will not limit the scope of a claim (Walter , 618 F.2d at 769, 205 USPQ at 409; MPEP 2106). Additionally, in apparatus claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim (In re Casey,152 USPQ 235 (CCPA 1967); In re Otto , 136 USPQ 458, 459 (CCPA 1963); MPEP2111.02).

Stramke teaches a capacitive plasma processing apparatus (Figure 1; column 3; line 57 – column 4, line 19) including a switch (“S1”; Figure 1; column 3; line 57 – column 4, line 19) for a current sensor (12; Figure 1; column 3; line 57 – column 4, line 19).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Murata to use Patrick et al’s system for plasma dynamic control including optimizing the relative frequencies between Murata’s plasma excitation electrode and Murata’s radio frequency generator depending on the geometry of the plasma chamber and dynamic processing conditions.

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Murata and Patrick to add a switch to the RF parameter sensor as taught by Stramke.

Motivation for Murata to use Patrick et al’s system is for plasma dynamic control including optimizing the relative frequencies between Murata’s plasma excitation electrode and Murata’s radio frequency generator depending on the geometry of the plasma chamber and dynamic processing conditions is for enabling the repeatability and uniformity of plasma processing as taught by Patrick et al (column 3; lines 55-65) and Murata (column 8; lines 45-59).

Motivation for Murata and Patrick to add a switch to the RF parameter sensor as taught by Stramke is to allow for current sampling durations as taught by Stramke (column 4; lines 46-50).

It would be obvious to those of ordinary skill in the art to optimize the operation of the claimed invention (In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980); In re Hoeschele , 406 F.2d 1403, 16_0 USPQ 809 (CCPA 1969); Merck & Co. Inc . v. Biocraft Laboratories Inc. , 874 F.2d 804, 1_0 USPQ2d 1843 (Fed. Cir.), cert. denied , 493 U.S. 975 (1989); In re Kulling , 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990), MPEP 2144.05).

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Murata to optimize the size/dimension of Murata's apparatus.

Motivation for Murata to optimize the size/dimension of Murata's apparatus is for plasma dynamic control including optimizing the relative frequencies between Murata's plasma excitation electrode and Murata's radio frequency generator depending on the geometry of the plasma chamber and dynamic processing conditions is for enabling the repeatability and uniformity of plasma processing as taught by Murata (column 8; lines 45-59). Further, it is well established that changes in apparatus dimensions are within the level of ordinary skill in the art.(Gardner v. TEC Systems, Inc. , 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied , 469 U.S. 830, 225 USPQ 232 (1984); In re Rose , 220 F.2d 459, 105 USPQ 237 (CCPA 1955); In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); See MPEP 2144.04)

7. Claims 83, 84 and 90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Murata et al (USPat. 5,423,915), Patrick (USPat. 5,474,648), and Stramke (USPat. 4,645,981) in view of Robertson; Robert et al. (US 5366585 A). Murata, Patrick, and Stramke are discussed above.

Murata further teaches:

i. A plasma processing apparatus (Figure 1; column 5; line 44 - column 6; line 11) comprising: a plasma processing chamber (1; Figure 1; column 5; line 44 - column 6; line 11) comprising at least one chamber (1; Figure 1; column 5; line 44 - column 6; line 11) wall (1; Figure 1); a radio frequency generator (4; Figure 1; column 5; line 44 - column 6; line 11) for supplying a radio frequency voltage to the electrode (2; Figure 1; column 5; line 44 - column 6; line 11) a radio frequency feeder (105; Figure 1; column 5; line 44 -

column 6; line 11) connected to the electrode (2; Figure 1; column 5; line 44 - column 6; line 11); a matching circuit (104; Figure 1; column 5; line 44 - column 6; line 11) having an input terminal (104/4 interface; Figure 1; column 5; line 44 - column 6; line 11) and an output (106, 109; Figure 1; column 5; line 44 - column 6; line 11) end, wherein the input terminal (104/4 interface; Figure 1; column 5; line 44 - column 6; line 11) is connected to the radio frequency generator (4; Figure 1; column 5; line 44 - column 6; line 11) – claim 90

Murata does not teach:

i. a measuring terminal for measuring a resonant frequency of the plasma processing chamber (1; Figure 1; column 5; line 44 - column 6; line 11) in the vicinity of an end of the radio frequency feeder (105; Figure 1; column 5; line 44 - column 6; line 11); and a switch positioned between the radio frequency feeder (105; Figure 1; column 5; line 44 - column 6; line 11) and the measuring terminal, the switch having a first configuration comprising a connection between the end of the radio frequency feeder (105; Figure 1; column 5; line 44 - column 6; line 11) and the output (106, 109; Figure 1; column 5; line 44 - column 6; line 11) end of the matching circuit (104; Figure 1; column 5; line 44 - column 6; line 11) and a second configuration comprising a connection between the end of the radio frequency feeder (105; Figure 1; column 5; line 44 - column 6; line 11) and the measuring terminal, the first configuration corresponding to a plasma excitation mode of the chamber (1; Figure 1; column 5; line 44 - column 6; line 11) and the second configuration corresponding to a measuring mode of the chamber (1; Figure 1; column 5; line 44 - column 6; line 11), wherein the first series resonant frequency f0 corresponds to

a minimum impedance of the plasma processing chamber (1; Figure 1; column 5; line 44 - column 6; line 11) – claim 90

ii. a thickness of the insulation material between the plasma excitation electrode (2; Figure 1; column 5; line 44 - column 6; line 11) and the chamber (1; Figure 1; column 5; line 44 - column 6; line 11) wall (1; Figure 1) is sufficient to provide a vertical spacing between the shower plate and an inwardly protruding portion of the chamber (1; Figure 1; column 5; line 44 - column 6; line 11) wall (1; Figure 1), the thickness being such that three times the first series resonant frequency f0 is larger than a power frequency fe supplied from the radio frequency generator (4; Figure 1; column 5; line 44 - column 6; line 11) – claim 90. However, Applicant's claim limitation of "the thickness being such that three times the first series resonant frequency f0 is larger than a power frequency fe supplied from the radio frequency generator" is an intended use claim requirement. The claimed *process variables* fo and fe are not structural components of the pending apparatus claims as argued above. Further, the claim, and specification (see above), provide no relationship between the three variables of insulator thickness, fo, and fe.

Murata, Patrick, and Stramke do not teach:

i. The plasma processing apparatus (Figure 1; column 5; line 44 - column 6; line 11) according to claim 74, wherein the plasma excitation electrode (2; Figure 1; column 5; line 44 - column 6; line 11) comprises an overlapping area with respect to the chamber wall, the overlapping area *adapted* to set the first series resonant frequency f0 such that three times the first series resonant frequency f0 is larger than a power frequency fe

supplied from the radio frequency generator (4; Figure 1; column 5; line 44 - column 6; line 11), as claimed by claim 83.

ii. The plasma processing apparatus (Figure 1; column 5; line 44 - column 6; line 11) according to claim 74, wherein the radio frequency feeder (105; Figure 1; column 5; line 44 - column 6; line 11) has a length *adapted* to set the first series resonant frequency fo such that three times the first series resonant frequency f0 is larger than the power frequency fe, as claimed by claim 84

iii. Murata's plasma excitation electrode (2; Figure 1; column 5; line 44 - column 6; line 11) for exciting a plasma and including a *projection* at a lower side thereof; a shower plate disposed under Murata's plasma excitation electrode (2; Figure 1; column 5; line 44 - column 6; line 11) and in contact with the projection, the shower plate having a number of holes; an insulation material between Murata's plasma excitation electrode (2; Figure 1; column 5; line 44 - column 6; line 11) and Murata's chamber wall (1; Figure 1) – claim 90

Robertson teaches a similar capacitive plasma reactor in Figure 2A. In particular, Robertson teaches a plasma excitation electrode (232/piece above 232 connecting to RF; Figure 2A) for exciting a plasma and including a projection (vertical walls of 232/piece above 232; not numbered; Figure 2A – compare to Applicant's 4a, Figure 11) at a lower side thereof. Robertson also teaches a perforated showerhead plate (292; Figure 2A) at the gas introduction point (232; Figure 2A) in the reactor (200; Figure 2A). Robertson's shower plate (292; Figure 2A) is disposed under Robertson's plasma excitation electrode (232/piece above 232 connecting to RF; Figure 2A) and in contact with the projection (vertical walls of 232/piece above 232; not

numbered; Figure 2A – compare to Applicant's 4a, Figure 11), Robertson's shower plate (292; Figure 2A) having a number of holes (293; Figure 2A); an insulation material (294; Figure 2A) between Murata's plasma excitation electrode (232/piece above 232 connecting to RF; Figure 2A) and Murata's chamber wall (212; Figure 2A) – claim 90

It would have been obvious to one of ordinary skill in the art at the time the invention was made for Murata to use Patrick et al's system for plasma dynamic control including optimizing the relative frequencies between Murata's plasma excitation electrode and Murata's radio frequency generator depending on the geometry of the plasma chamber and dynamic processing conditions, further, for Murata and Patrick to add Robertson's shower plate arrangemen of Figure 2A.

Motivation for Murata to use Patrick et al's system for plasma dynamic control including optimizing the relative frequencies between Murata's plasma excitation electrode and Murata's radio frequency generator depending on the geometry of the plasma chamber and dynamic processing conditions is for enabling the repeatability and uniformity of plasma etching processes as taught by Patrick et al (column 3; lines 55-65), motivation for Murata and Patrick to add Robertson's shower plate is for even gas distribution.

It would be obvious to those of ordinary skill in the art to optimize the operation of the claimed invention (In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980); In re Hoeschele , 406 F.2d 1403, 16_0 USPQ 809 (CCPA 1969); Merck & Co. Inc . v. Biocraft Laboratories Inc. , 874 F.2d 804, 1_0 USPQ2d 1843 (Fed. Cir.), cert. denied , 493 U.S. 975 (1989); In re Kulling , 897 F.2d 1147, 14 USPQ2d 1056 (Fed. Cir. 1990), MPEP 2144.05).

Response to Arguments

8. Applicant's arguments filed January 4, 2010 have been fully considered but they are not persuasive.

9. Applicant’s heading “Rejections of the claims under 35 USC 102 ***and/or*** **103**” is inaccurate in view of the fact that no anticipation rejection/argument was made in the present and prior action. Only rejections under 35 USC 103 are proposed.

10. Applicant states:

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In contrast, Applicants' claimed switch is provided at a position at which a switching operation cannot be performed during plasma processing, and if a switching state is changed during plasma processing, plasma excitation is stopped. In the prior art cited by the Examiner, there is no need to provide a switch at this position. Either alone or in combination, the references cited by the Examiner do not disclose or suggest such an apparatus structure. Nor does the cited art teach or suggest a plasma processing chamber configured to provide the claimed relationship between the first series resonant frequency f0 and the power frequency fe, as the Examiner has acknowledged in previous Office actions.

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In response, the Examiner presumes then that Applicant is taking the position that the combined teachings of the prior art, and, in particular, the teaching of Stramke of a switch ("S1"; Figure 1; column 3; line 57 – column 4, line 19) for a current sensor (12; Figure 1; column 3; line 57 – column 4, line 19) is *structurally* incapale of performing the argued *use* . In response, the Examiner notes that *when the structure recited in the reference is substantially identical to that of the claims, claimed properties or functions are presumed to be inherent* (In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977); MPEP 2112.01). As a result, the Examiner finds no evidence that the teachings of the prior art, when combined, *cannot* perform the argued use or has the argued properties.

Conclusion

11. Applicant's amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Rudy Zervigon whose telephone number is (571) 272-1442. The examiner can normally be reached on a Monday through Thursday schedule from 8am through 6pm EST. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Any Inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Chemical and Materials Engineering art unit receptionist at (571) 272-1700. If the examiner can not be reached please contact the examiner's supervisor, Parviz Hassanzadeh, at (571) 272- 1435.

/Rudy Zervigon/

Primary Examiner, Art Unit 1792